

Chesapeake Bay Sentinel Site Cooperative

From data collection to decision support for a changing Bay

The Chesapeake Bay region is currently experiencing some of the highest relative sea level rise rates, up to 5.8 mm/yr (0.23 in/yr), reported within the United States. Natural resources and built infrastructure in both metropolitan and rural areas are experiencing direct impacts of rising tidal water levels including inundation and salt intrusion. The National Oceanic and Atmospheric Administration (NOAA) has initiated a Sentinel Site Program (SSP) to encourage federal, state and local partners to cooperatively address impacts of climate change, with an initial emphasis placed on rising sea levels.

In 2011, NOAA selected Chesapeake Bay as one of five initial regional Sentinel Site Cooperatives (SSC) to demonstrate the value of using a place-based approach to address issues of local, regional and national significance. The sentinel site network strategy will leverage existing assets, programs, and resources; additionally, targeted investment from multiple groups at similar sites will dramatically increase the effectiveness of these efforts. Priority strategies for the Chesapeake Bay SSC include establishing an integrated network of habitat sentinel sites, developing information products, supporting modeling efforts, enhancing data availability, and providing advisory services.

Habitat Sentinel Site Network: The Chesapeake Bay SSC will develop an integrated sentinel site network that leverages existing resources, and integrates assets across existing federal, state and academic programs. Each sentinel site represents intensively studied ecosystems exposed and sensitive to sea level rise stressors. Initial efforts are focused on direct sea level associated variables including water level, water temperature and salinity, and marsh surface elevation. The project will expand to include long term coastal habitat and living resource surveys at representative sites in the network.

Information Products and Modeling Support: The Cooperative's efforts will improve inundation and habitat mapping; support physical and integrated ecosystem modeling; develop strategies to facilitate ecosystem resiliency and adaptation; and inform vulnerability assessments. Strengthening existing collaborations and building new partnerships across federal, state, local and other regional agencies and academic institutes will help ensure that the data collected can help validate and support modeling efforts and risk assessments.

Data Archive and Catalog: The Chesapeake Bay SSC aims to provide an organizational structure to relevant data that are often scattered, fragmented, and incompatible across agencies, organizations and jurisdictional boundaries. Access or knowledge of available information is fundamental to the decision-making process, so this organizational structure will support local information needs as well as facilitate data synthesis and model development and calibration.

Advisory Service: The Cooperative strives to be an "expertise resource" to support and guide natural resource managers, coastal communities, and policy-makers through the dissemination of unbiased, science-based information. This service is focused at the local level and can occur in a variety of formats including the development of localized information products, providing topic and/or regional oriented speakers, attending public planning meetings for comment or advice, and supporting professional training programs, typically provided by partner organizations.



Volunteers plant marsh grasses on Barren Island in the Chesapeake Bay. Photo from NOAA's National Geodetic Survey.

Partners and Assets

A strength of the Chesapeake Bay SSC is the regional partners' data, knowledge and expertise that, in aggregation, will protect the bay and its citizens for years into the future. Members of the Chesapeake Bay SSC (or Cooperative) include science agencies, academic institutions and other organizations with relevant living resources, water quality and geospatial monitoring programs and data synthesis capacity. The understanding of environmental and socioeconomic changes attributable to sea level rise, increased by these groups, will inform management decisions concerning Bay living resources and coastal communities.

Current and Potential Partners

- Federal: NOAA; U.S. FWS; U.S. NPS; USGS; USACE; Smithsonian Environmental Research Center
- State: State of Maryland; Commonwealth of Virginia
- University: University of Maryland Center for Environmental Sciences; Virginia Institute of Marine Science; Old Dominion University; The Johns Hopkins University

Current and Potential Assets

- 20 NOAA tide stations, 14 with long term sea level trends and temperature records
- Over 200 surface elevation table datasets, monitoring wetland elevation change
- Chesapeake Bay Interpretive Buoy System, a network of 10 oceanographic buoys located along the main-stem of the Bay
- Two multi-component National Estuarine Research Reserves with related research, monitoring, professional training, formal education and public outreach programs
- Water quality, plankton, and benthic monitoring data/programs in MD and VA, ongoing with decadal datasets
- Chesapeake Inundation Prediction System, with site-specific storm surge models
- Long-term USGS river discharge and stream gauge network



Muddy Creek Entrance, Virginia. Photo from Smithsonian Environmental Research Center (SERC).

Point of Contact:

Christine Gallagher, NOAA's National Geodetic Survey, christine.gallagher@noaa.gov

Interim Chesapeake Bay Sentinel Site Cooperative Steering Committee:

Sean Corson, NOAA, Chesapeake Bay Office

Chris Cortina, Maryland Department of Natural Resources

Jennifer Faught, NOAA, Climate Program Office

Christine Gallagher, NOAA, National Geodetic Survey

Phillipe Hensel, NOAA, National Geodetic Survey

Laurie McGilvray, NOAA, Estuarine Reserves Division

Shep Moon, Virginia Department of Environmental Quality

William Reay, Virginia Institute of Marine Science and Chesapeake Bay National Estuarine Research Reserve

Kevin Sellner, Chesapeake Research Consortium